Project B-209

INDUSTRIAL AND FARM PUMPS

A Manufacturing Opportunity in Georgia

Prepared for
Georgia Department of Industry and Trade
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by

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March 1963

Table of Contents

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Tables

Foreword

Unlike the majority of the special manufacturing opportunity studies which the Division has completed, this analysis concerns an industry which has been characterized in recent years by excess production capacity, as well as by increasing labor costs. The primary considerations in this case therefore involve the several economic advantages which a Georgia location would offer -- which should make it possible for one or more firms to take advantage of the situation to reduce the tight squeeze on profits which has affected companies in the field.

Like the other analyses completed, this one points up the attractions which the sizable southeastern market offers. Given the situation which exists in the industry, primary consideration must be given to other factors, however. These are the savings that can be achieved as a result of the relatively low production labor costs, proximity to material sources, freight costs and transportation facilities. This combination of advantages points up the opportunity for firms in this particular industry to locate profitable production facilities in Georgia.

This is the fifth analysis in the current series of studies in preparation for the recently renamed Georgia Department of Industry and Trade. Questions and requests for additional information will be welcomed.

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Summary

A Georgia location offers the following advantages as a site for a pump plant:

1. Savings in the cost of production labor amounting to 6.1% to 9.3% of sales value. (Net profit before taxes in the industry amounts to approximately 10% of sales.)
2. Reduction in freight cost to southeastern customers (Map 1) amounting to 1.2% to 1.4% of the value of the products.
3. Production of all materials required for pump manufacture in the Southeast except stainless steel, integral horsepower electric motors, and roller bearings.
4. Abundant transportation facilities for shipment regionally or nationally.

Because of the fact that savings in labor cost would more than offset the freight expense of shipping outside the Southeast, a Georgia plant could economically serve the U. S. market in competition with present major producers.

Sales of pumps in the six-state freight advantage area in 1961 were as follows:

Industrial Pumps	$26.4 million to $29.7 million
Hydraulic Fluid Power Pumps	$ 6.6 million to $ 7.4 million
Farm Pumps	$12.7 million

This volume of sales is sufficient to justify a pump plant in the area although the actual market area served would undoubtedly be larger than the six-state region. National shipments of industrial and hydraulic fluid power pumps in 1961 amounted to $369.8 million, while farm pump shipments were $65.0 million in the same year.

The important factors to be considered in the location of a new pump facility are the cost of production labor in the area, the local production of materials required for pump manufacture, and the size of the market that can be economically served by a local plant.

INTRODUCTION

It is the intent of this report to make a general analysis of the economics of manufacturing industrial and farm pumps in Georgia in comparison with production by existing major firms located in the Midwest and in the northeastern section of the U. S. The pump industry in recent years has been characterized by excess production capacity and increasing labor costs. This, in turn, has caused a very tight squeeze on profits of the manufacturers. It is primarily toward those manufacturers most affected by the profit squeeze and those whose sales are expanding that this report is directed. Significant benefits can be gained by these producers by locating new facilities in the state of Georgia.

The products covered in the study include industrial pumps (reciprocating, vertical turbine, centrifugal, propeller and mixed flow, rotary, hydraulic fluid power, wet vacuum, and industrial pumps not specified by kind), and farm pumps (jet, non-jet, convertible jet, and submersible).

The principal users of pumps include the following industries: public health, water supply and treatment, sewage disposal, air purification, power generation, petroleum production and refining, transportation, mining, chemical processing, and various other industries.

The study analyzes the economic advantages of a Georgia location including labor costs, proximity to material sources, freight costs and transportation facilities. The freight advantage area for an Atlanta plant location is indicated (Map 1), and an analysis of the economic-size market area is made. Finally, brief descriptions of sales volumes and the important criteria used in plant location decisions are related.

ADVANTAGES OF A GEORGIA LOCATION

The principal advantages which Georgia offers as a location for a manufacturer of industrial and farm pumps are:

1. greater product output per dollar of production wages paid,
2. production of materials required for pump manufacture in and near Georgia,
3. substantial freight savings to customers in a six-state southeastern region, and
4. abundant transportation facilities.

Greater Product Output per Dollar of Production Wages Paid

The ratio of the value of shipments per dollar of production wages expended for Georgia and the major producing states is indicated in Table 1.

Table 1

VALUE OF SHIPMENTS PER DOLLAR OF PRODUCTION WAGES EXPENDED FOR PUMPS AND COMPRESSORS (SIC 3561) IN GEORGIA AND MAJOR PRODUCING STATES

Producing State	Value of Shipments per Dollar of Production Wages Expended
Pennsylvania	$ 4.492
Massachusetts	5.272
Michigan	5.305
Ohio	5.450
Wisconsin	6.006
New York	6.051
Texas	6.918
Illinois	7.031
New Jersey	7.220
Indiana	7.472
California	7.525
GEORGIA	12.759

Source: Calculated from data in 1958 Census of Manufactures, U. S. Department of Commerce, Bureau of the Census.

Based on these ratios the total production labor costs for shipments of $2 million, $10 million, and $20 million annually were computed and are given in Table 2. From the table it is determined that a Georgia plant's production labor costs would be 39% to 59% less than those for plants located in the major producing states.

Table 2

COMPARISON OF PRODUCTION LABOR COSTS FOR MANUFACTURING PUMPS IN GEORGIA AND MAJOR PRODUCING STATES

	Production Labor Cost of		
Producing State	$2 Million Shipments	$10 Million Shipments	$20 Million Shipments
Pennsylvania	$445,236	$2,226,180	$4,452,360
Massachusetts	379,363	1,896,813	3,793,630
Michigan	377,003	1,885,014	3,770,030
Ohio	366,972	1,834,862	3,669,720
Wisconsin	333,000	1,665,002	3,330,000
New York	330,524	1,652,619	3,305,240
Texas	289,100	1,445,504	2,891,000
Illinois	284,455	1,422,273	2,844,550
New Jersey	277,008	1,385,042	2,770,080
Indiana	267,666	1,338,330	2,676,660
California	265,781	1,328,904	2,657,810
GEORGIA	156,752	783,760	1,567,520

The importance of the lower labor costs is emphasized when they are related to profits. Operating profits before taxes of pump manufacturers amount to approximately 10% of sales. Production labor costs amount to approximately 15.7% of shipments (sales). The above reduction in production labor costs of 39% to 59% would amount to a 6.1% to 9.3% reduction in the cost as a percent of shipment value -- a very substantial savings.

Production in the Area of Materials Required for Pump Manufacture

The primary materials consumed in the pump and compressor industry (SIC 3561) in 1958 with the relative importance of their costs are shown in Table 3.

Table 3

MATERIALS CONSUMED IN THE PUMP AND COMPRESSOR INDUSTRY

Material	Material Cost (Percent of Total)
Mill Shapes and Forms:	
Carbon steel (bars, sheet, plate, wire, etc.)	5.1
Alloy steel (except stainless)	1.3
Stainless steel	1.3
Copper and copper-base alloy	1.4
Aluminum and aluminum-base alloy	.3
Castings:	
Iron	10.0
Steel	3.6
Copper and copper-base alloy	2.8
Aluminum and aluminum-base alloy	.6
Iron and Steel Forgings	1.3
Fractional Horsepower Electric Motors	5.0
Integral Horsepower Electric Motors	5.9
Ball and Roller Bearings	1.1

Source: 1958 Census of Manufactures, U. S. Department of Commerce, Bureau of the Census.

Appendix 1 indicates the production of these materials by state in the Southeast. All materials are produced in the area except stainless steel, integral horsepower motors and roller bearings. Of these only the integral horsepower motors account for a significant portion (5.9%) of total material costs for the industry. Since freight is allowed by the producers on electric motors when not shipped as part of an integrated item of equipment, there would be no freight disadvantage to a Georgia plant in procuring the motors outside the area. There would be a slight freight disadvantage in procuring stainless steel and roller bearings outside the region, however.

Freight Costs on Shipments of Pumps in the Freight Advantage Area

A Georgia pump plant could deliver the product to customers in the Southeast at a significantly lower freight cost than major competing establishments. As an example of the potential savings involved, Table 4 compares the annual

Table 4

ANNUAL FREIGHT COSTS ON $2 MILLION SHIPMENTS OF PUMPS FROM ATLANTA AND MAJOR PRODUCING AREAS TO SOUTHEASTERN DESTINATIONS

TO:	Shipments[1]	Weight of Shipments[2] (pounds)	Annual Freight Costs FROM: Atlanta	Chicago	Milwaukee	Seneca Falls (N. Y.)
Atlanta	$ 824,000	824,000	$ 1,236.00	$14,996.80	$15,985.60	$15,408.80
Birmingham	306,000	306,000	1,683.00	5,202.00	5,569.20	6,609.60
Charlotte	280,000	280,000	2,800.00	5,544.00	5,796.00	5,180.00
Memphis	310,000	310,000	3,782.00	4,557.00	4,960.00	6,696.00
Miami	280,000	280,000	4,424.00	7,560.00	7,812.00	7,644.00
TOTALS	$2,000,000		$13,925.00	$37,859.80	$40,122.80	$41,538.40

1/ Shipments were divided among the southeastern wholesaling centers according to the volume of Machinery, Equipment, and Supplies (SIC 508) wholesaled in each city in 1958 (1958 Census of Business -- Wholesale Trade).

2/ Weights based on an average value per pound of $1 (computed from a leading manufacturer's published data on prices and shipping weights).

freight costs on shipments into the freight advantage area (Map 1) from Atlanta and major pump plants. The table reveals that the savings in freight cost on $2 million shipments for an Atlanta operation range from $23,900 to $27,600 annually. This amounts to a reduction in delivered cost of 1.2% to 1.4%.

Although freight costs are not nearly as significant as labor costs, they do add a considerable amount to the purchase cost for large users and cannot be overlooked in plant location decisions.

Transportation Facilities

Pumps are generally shipped by motor carrier, whereas the materials necessary for their production are shipped by truck and rail. The transportation network in Georgia is more than adequate to handle the shipments of a local pump plant to both the southeastern and national markets.

Atlanta's transportation facilities alone consist of 32 rail carriers (including 15 Class 1 railroads), 100 motor carriers, and six air freight carriers. Atlanta's municipal air terminal serves 54 cities non-stop and ranks third in the nation in number of commercial aircraft departures and sixth in number of passengers boarded. Typical airline flying time between Atlanta and other major cities in the U. S. are given in Table 5.

Table 5

TYPICAL AIRLINE TIME BETWEEN ATLANTA AND SELECTED POINTS

City	Time
Baltimore	1 hour, 18 minutes
New York	1 hour, 39 minutes
Chicago	1 hour, 29 minutes
Los Angeles	4 hours, 7 minutes
Dallas	1 hour, 53 minutes
Miami	1 hour, 38 minutes
Pittsburgh	1 hour, 49 minutes
Cleveland	1 hour, 40 minutes

ECONOMIC MARKET AREA FOR A GEORGIA PLANT

The economic-size market area for a manufacturer of pumps in Georgia is defined as the geographic area in which the Georgia plant could provide the product to the customer at a lower delivered cost than major competing plants. The freight advantage area for a manufacturer of pumps in Georgia is defined as the area in which the Georgia plant could provide lower freight costs to the customer than all principal competitors.

The approximate freight advantage area for a Georgia plant is indicated in Map 1. The area covers the six states of Alabama, Florida, Georgia, North Carolina, South Carolina and Tennessee. The economic-size market area would be much larger than this, however, since the additional freight costs involved in shipping outside the freight advantage area would be more than offset by savings in labor costs.

Actually, a Georgia plant could economically sell to the U. S. market in competition with major producers. Table 6 compares labor costs and freight costs on shipments valued at $10 million to major wholesaling centers throughout the U. S. for plants in principal producing cities and in Atlanta (representing a Georgia location). Although the freight costs from Atlanta to the U. S. market are greater than from Chicago and Seneca Falls, the total costs of freight and labor from the Georgia location would be less by $605,000 and $857,000, respectively. The savings amount to 6.1% of the value of the product over a Chicago plant and 8.6% of the value over a Seneca Falls establishment. The total savings over a Los Angeles plant amount to approximately $712,000, or 7.1% of the shipment value.

From these comparisons it is apparent that an Atlanta facility could provide the product to customers throughout the U. S. at a lower delivered cost than present major producing pump plants.

MAP 1

APPROXIMATE FREIGHT ADVANTAGE AREA FOR AN ATLANTA PUMP PLANT

(Area in Which an Atlanta Plant Would Have Freight Advantage Over All Other Major Plants)

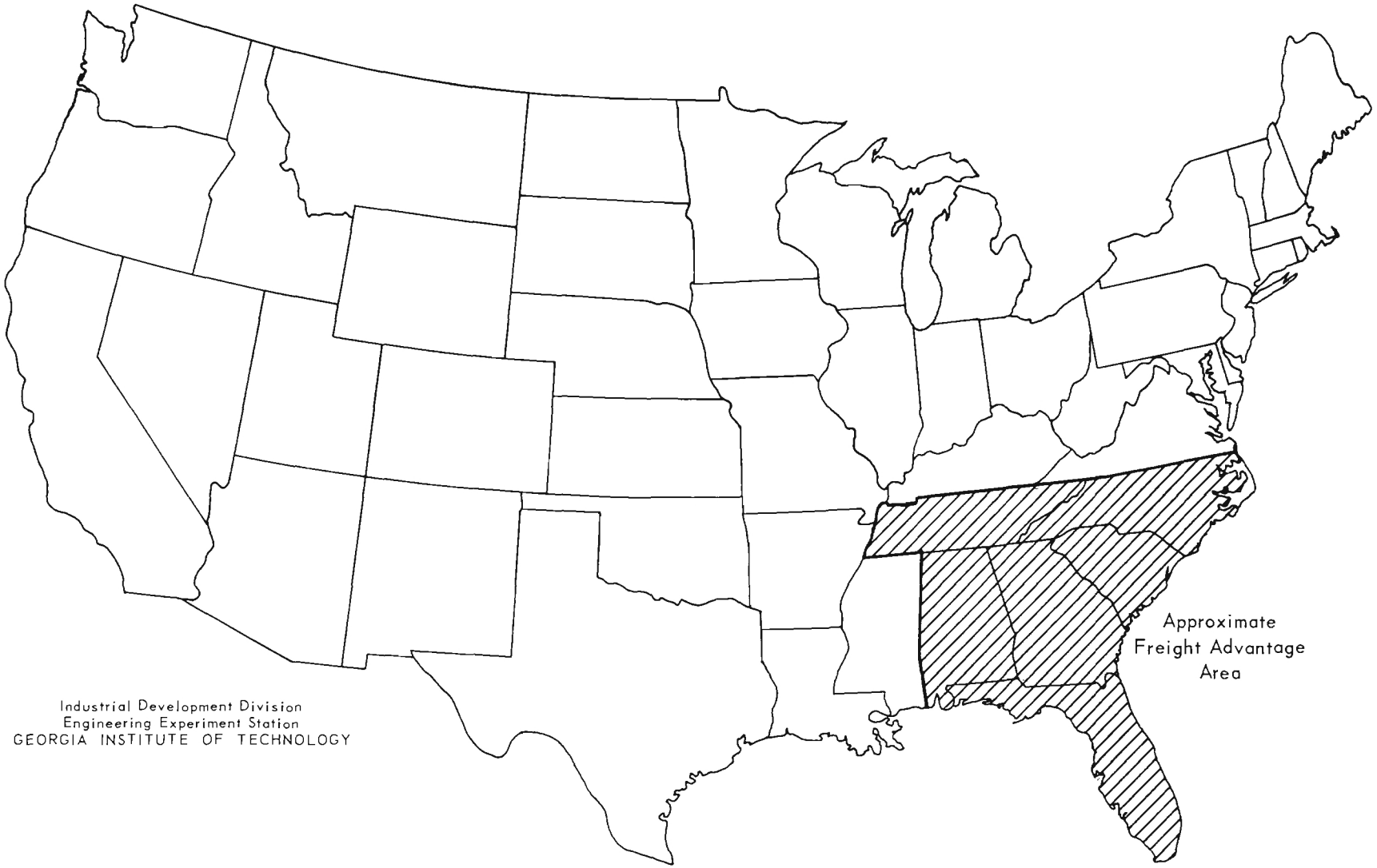

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Table 6

COMPARISON OF LABOR AND FREIGHT COSTS FOR PLANTS IN SELECTED LOCATIONS SHIPPING $10 MILLION IN PUMPS TO MAJOR USING AREAS IN THE U. S.

To	Value of Shipments[1]	Freight Costs[2] From: Atlanta	Chicago	Seneca Falls	Los Angeles
Atlanta	$ 380,000	$ 570	$ 6,916	$ 7,106	$ 17,214
Boston	500,000	8,702	10,450	6,150	27,900
New York	2,410,000	48,441	47,959	26,510	120,500
Philadelphia	760,000	14,288	14,592	8,664	42,408
Pittsburgh	510,000	9,588	5,916	5,967	23,460
Chicago	1,770,000	32,214	1,770	27,789	72,570
Cleveland	510,000	9,180	4,998	5,406	23,460
Detroit	890,000	16,198	8,010	12,104	39,160
Houston	500,000	10,350	12,900	13,800	18,050
Los Angeles	1,140,000	47,652	45,600	63,612	(e) 1,140
San Francisco	630,000	26,334	25,200	35,154	4,725
TOTAL	$10,000,000	$223,517	$184,311	$212,262	$390,587
TOTAL LABOR COSTS[3]		$783,760	$1,422,273	$1,652,619	$1,328,904
TOTAL FREIGHT AND LABOR COSTS		$1,007,277	$1,606,584	$1,864,881	$1,719,491

(e) - estimated.

1/ Shipments were divided among the cities of destination according to the amount of General Industrial Machinery (SIC 5082) wholesaled in each city in 1958. This category of equipment includes pumps.

2/ Freight costs are based on truckload rates for 40,000 lb. minimum weight. (See Appendix 3.)

3/ Labor costs are based on computations summarized in Table 2.

SALES OF PUMPS

Regional Sales

Manufacturers' sales of industrial pumps (other than hydraulic fluid power pumps) in the six-state freight advantage area (Map 1) are estimated to have been between $26.4 million and $29.7 million in 1961. This represents an increase of 4% to 8% over 1958 sales. Sales of hydraulic fluid power pumps in the area are estimated to have been between $6.6 million and $7.4 million in 1961, an increase of 16% to 21% over 1958 sales. Manufacturers' sales of farm pumps in the area in 1961 amounted to $12.7 million, a 6.7% increase over 1958.[1/]

Sales of industrial and farm pumps in the freight advantage area should continue to increase in the immediate future as the size of the using industries in the area increases.

National Sales

U. S. shipments of industrial and farm pumps are summarized in Table 7. Shipments of industrial pumps for years previous to 1958 are not available on a comparable basis with the data indicated. The data for 1958 through 1962 are not sufficient to indicate a definable statistical trend. However, it is believed that the trend of shipments will be slightly upward in the 1960's as the general economy expands. Although the value of farm pump shipments has been erratic, the quantity of farm pumps shipped shows an increasing trend. Based on the least squares trend of quantity of farm pumps shipped from 1951 through 1961, the shipments in 1965 should amount to 794,395 units valued at $67.8 million.

1/ See Appendix 2 for the methods used in estimating sales of all three categories of pumps.

Table 7

U. S. SHIPMENTS OF PUMPS, 1951 - 1962

Year	Value of Shipments (in thousands of dollars) Industrial[1/]	Farm
1951		59,959
1952		67,741
1953		69,259
1954		71,216
1955		74,899
1956		72,176
1957		72,256
1958	360,790	63,975
1959	398,974	72,063
1960	373,057	61,638
1961	369,810	64,958
1962	395,426	

1/ Includes reciprocating, vertical turbine, centrifugal, propeller and mixed flow, rotary, hydraulic fluid power, wet vacuum, and industrial pumps not specified by kind.

Sources: Pumps, Compressors, Fans and Blowers Industries, Business and Defense Services Administration, U. S. Department of Commerce (industrial pumps); Current Industrial Reports, Series M35G, U. S. Department of Commerce (farm pumps).

LOCATION FACTORS

The important factors to consider in the selection of an area in which to construct a new pump plant are:

1. production labor costs in the area,
2. the production of materials required for pump manufacture in the area, and
3. the size of the market that can be economically served.

Production Labor Costs

The importance of production labor costs for industrial, hydraulic fluid power, and farm pumps is indicated in Table 8.

Table 8

THE IMPORTANCE OF PRODUCTION LABOR COSTS IN PUMP MANUFACTURE

Type of Pump Manufactured	Production Labor Cost As Percent of Value Added by Manufacture
Industrial	34.6
Hydraulic Fluid Power	32.6
Farm	31.1

Source: 1958 Census of Manufactures, U. S. Department of Commerce.

Production labor costs amount to approximately a third of the total value added by manufacture. A 10% reduction in the cost of this item would amount to a 3% to 4% reduction in the value added by manufacture. Since labor costs do vary considerably in different regions of the U. S., as indicated in Table 1, they are a primary consideration in the selection of an area in which to construct a new plant.

Availability of Materials

It is also desirable to locate a new facility reasonably close to sources of materials needed in the production of pumps in order to minimize freight costs on the items. Most of the materials have a low value per pound of weight, as indicated in Table 9, and consequently shipping them over a long distance would appreciably increase their cost.

Table 9

VALUE PER POUND OF SELECTED MATERIALS CONSUMED IN THE MANUFACTURE OF PUMPS

Material[1/]	Value per Pound
Castings	$0.264
Carbon steel	0.102
Copper and copper-base alloy	0.618

1/ The materials listed accounted for 36% of the total cost of materials, parts, containers and supplies consumed in the industry in 1958.

Source: 1958 Census of Manufactures, U. S. Department of Commerce.

An increase in freight cost of one-half cent per pound would increase the cost of castings 2% or carbon steel 5%. The increased freight cost ($0.005 per pound) would not be so important for the copper and copper-base alloy items, since the cost of these materials would be increased by less than 1%. The important materials needed close to the plant, therefore, are carbon steel and castings.

Market Area

Since no plant can expect to make all sales in a given region, the volume of sales in the economic-size market area for the plant should be several times the value of output of the proposed plant. In the pumps and compressors industry (SIC 3561), plants with 100 or more employees controlled 86.2% of the shipments of the industry in 1958. The average annual shipments per plant in this category amounted to $7.9 million and should be typical for pump manufacturers. A new plant, therefore, must be able to economically serve a market region having total sales of three to four times the output of a typical plant -- $23.7 million to $31.6 million.

CONCLUSION

A Georgia pump plant can be justified to serve the six-state southeastern market (Map 1). The market is approximately four times as large as the annual output of a typical pump plant. A Georgia plant serving this region would not only benefit from greater efficiency of the production labor dollar, but would also provide customers with significantly lower freight costs compared with present major producers.

Because of the large output per dollar of production wages expended in Georgia (Table 1), a Georgia plant could more economically serve the U. S. pump market than present principal manufacturers. The savings in production labor costs would more than offset the additional cost of shipping outside the Southeast.

APPENDICES

Appendix 1

PUMP MATERIALS PRODUCED IN THE SOUTHEAST

Steel

Steel plates (sheared and universal) - Alabama, Kentucky

Hot rolled sheets - Alabama, Kentucky

Hot rolled strip - Alabama, Georgia, Tennessee

Hot rolled bars (light shapes, concrete reinforcing, and other) - Alabama, Georgia, Tennessee

Wire rods - Alabama, Georgia

Blooms and billets (foreign or export) - Kentucky

Cold finished bars - Alabama

Cold rolled and galvanized sheets - Alabama, Kentucky

Cold rolled strip - None in Southeast (nearest in Ohio)

Galvanized strip - Georgia

Stainless Steel

Sheets, plates, strips, coils - None in Southeast (nearest in Middletown, Ohio)

Billets and bars - Kentucky

Copper

Continuous roll formed shapes - Kentucky

Spun and extruded parts - Alabama

Aluminum

Extrusions - Alabama, Florida, Georgia, North Carolina, South Carolina

Wire and rod - Alabama, South Carolina, Tennessee

Sheets - Alabama, Tennessee

Plates - Tennessee

Foil - Tennessee

Castings

Three or more required alloys - Alabama, Georgia, Tennessee

Iron and Steel Forgings

Closed die drop forgings - Alabama

Steel forgings - Georgia, Tennessee

Fractional Horsepower Electric Motors

Georgia, South Carolina, Tennessee

Integral Horsepower Electric Motors

None in Southeast (nearest in Cincinnati and Dayton, Ohio)

Ball Bearings

Precision anti-friction ball thrust bearings - South Carolina

Precision ferrous and non-ferrous balls - Tennessee

General Line Roller Bearings

None in Southeast (nearest in Massillon, Ohio, and Indianapolis, Indiana)

Oil-Less Pump Bearings

None in Southeast (nearest in Dayton, Ohio, and Indianapolis, Indiana)

Appendix 2

METHODS OF ESTIMATING PUMP SALES IN SOUTHEAST

Industrial and Hydraulic Fluid Power Pumps

1. By amount of Commercial, Industrial Machinery, Equipment, Supplies (SIC 5082) wholesaled in the area in 1958:

   Formula:

   $$\frac{\text{Value SIC 5082 Wholesaled in Six-State Area}}{\text{Value SIC 5082 Wholesaled in U. S.}} \times \text{U. S. Shipments (1961)}$$

   a. Industrial Pumps (SIC 35611)

   $$= \frac{\$\ 1,465,073,000}{\$18,332,247,000} \times \$307,160,000^{1/} = \$24.6 \text{ million}$$

   b. Hydraulic Fluid Power Pumps (SIC 35612)

   $$= \frac{\$\ 1,465,073,000}{\$18,332,247,000} \times \$76,238,000 = \$6.1 \text{ million}$$

2. By number of employees in major using industries in Southeast in 1958:

   Formula:

   $$\frac{\text{Total Six-State Employment - SIC 2611, 2621, 2631, 2814, 2818, 2831, 2833, 2911, 3585}}{\text{Total U. S. Employment - SIC 2611, 2621, 2631, 2814, 2818, 2831, 2833, 2911, 3585}} \times \text{U. S. Shipments (1961)}$$

   a. Industrial Pumps (SIC 35611)

   $$= \frac{43,859 \text{ employees}^{2/}}{509,795 \text{ employees}} \times \$307,160,000 = \$26.4 \text{ million}$$

   b. Hydraulic Fluid Power Pumps (SIC 35612)

   $$= \frac{43,859 \text{ employees}}{509,795 \text{ employees}} \times \$76,238,000 = \$6.6 \text{ million}$$

3. By value of non-residential construction[3/] in six-state area[4/]:

   Formula:

   $$\frac{\text{Value of Non-Residential Construction, Six-State Area (1960)}}{\text{Value of Non-Residential Construction, U. S., (1960)}} \times \text{U. S. Shipments}$$

(See footnotes at end of table)

a. Industrial Pumps (SIC 35611)

$$= \frac{\$\ 1,184,767,000}{\$12,239,700,000} \text{ X } \$307,160 = \$29.7 \text{ million}$$

b. Hydraulic Fluid Power Pumps (SIC 35612)

$$= \frac{\$\ 1,184,767,000}{\$12,239,700,000} \text{ X } \$76,238,000 = \$7.4 \text{ million}$$

Farm Pumps

1. By quantity of farm pumps shipped to six-state area:

Formula:

$$\frac{\text{Quantity Shipped into Six-State Area (1961)}}{\text{Quantity Shipped, U. S. (including exports) (1961)}} \text{ X } \text{Value of U. S. Shipments (1961)}$$

$$= \frac{149,000 \text{ pumps}^{5/}}{763,000 \text{ pumps}} \text{ X } \$64,958,000 = \$12.7 \text{ million}$$

1/ See 1958 Census of Business -- Wholesale Trade.

2/ See 1958 Census of Manufactures.

3/ The Business and Defense Services Administration publication, Pumps, Compressors, Fans, and Blowers Industries, ER60-68, indicates a correlation between sales of these products and new construction.

4/ The figures used here include all of the six-state area except western Tennessee.

5/ See Current Industrial Reports, Series M35G and M35G-1, U. S. Bureau of the Census.

Appendix 3

TRUCKLOAD MOTOR FREIGHT RATES

(Pumps, power, NOI, or Working Heads, loose or in packages, or Power Pump or Working Head Parts, NOI, in packages or on skids)

TO	FROM							
	ATLANTA		CHICAGO		SENECA FALLS		LOS ANGELES	
	Rate	Min.	Rate	Min.	Rate	Min.	Rate	Min.
Atlanta	15	20M	182	22M	187	24M	518	20M
							453	34M
							410	60M
Boston	229	24M	209	20M	130	23M	558	24M
					123	30M		
New York	201	24M	199	20M	116	23M	554	28M
					110	30M	500	40M
							440	60M
Philadelphia	188	24M	192	20M	120	23M	558	24M
					114	30M		
Pittsburgh	188	24M	129	20M	124	23M	460	40M
			116	30M	117	30M	400	60M
Chicago	182	22M	(a)	(a)	157	20M	410	28M
							364	60M
Cleveland	180	22M	109	20M	106	20M	460	40M
			98	30M			400	60M
Detroit	182	22M	100	20M	136	20M	440	40M
			90	30M			387	60M
Houston	207	24M	258	20M	276	23M	459	7M
							407	10M
							361	14M
							(b) 250	36M
Los Angeles	479	24M	466	20M	558	24M		
	451	30M	400	30M				
	418	40M						
San Francisco	479	24M	466	20M	558	24M	(c) 75	24M
	451	30M	400	30M				
	418	40M						

Explanation of column headings:

Rate - rate applicable to minimum or greater weight, expressed in cents per hundredweight.

Min. - minimum weight, expressed in thousands of pounds.

Notes:

(a) - Minimum charge - $1.00; less than 2M - 40¢; 2M to 5M - 35¢; 5M to 10M - 30¢; 10M to 20M - 15¢; over 20M - 10¢.
(b) - Applicable only on export shipments.
(c) - Subject to surcharge of $1.60 per shipment.